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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/549,648	09/15/2005	Gregor Sagner	21810-US	2235

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Roche Molecular Systems, Inc.
Patent Law Department
4300 Hacienda Drive
Pleasanton, CA 94588

EXAMINER	
PANDE, SUCHIRA	
ART UNIT	**PAPER NUMBER**
1637	

MAIL DATE	DELIVERY MODE
08/21/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/549,648	SAGNER ET AL.	
	Examiner	Art Unit	
	SUCHIRA PANDE	1637	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11 June 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *15-17* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *15-17* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on June 11, 2009 has been entered.

Claim Status

2. Claims 1-14 are cancelled. Claims 15-17 are pending in the application and will be examined in this action.

Response to Arguments

Re objection to claim 15

3. Applicant has not made the correction to claim 15 as suggested. Hence objection to claim 15 is being maintained.

Re 103 rejection to claims 15-17 over King et al. in view of Pinkel et al. and Glazer et al.

4. Applicant's arguments filed June 11, 2009 have been fully considered but they are not persuasive. Applicant argues following:

a. King et al. teach a device that can be used in a PCR instrument, but not a PCR instrument per se.

Examiner's response: Applicant has not defined "device" and "instrument" in the specification as filed. In absence of any definition distinguishing the two, Examiner maintains that King et al. teach a PCR instrument.

b. Applicant further argues that King et al. does not teach a detection unit comprising at least 5 separate fluorescent detector entities, each of said detector entities having a central detection wavelength distinct from each other by at least 25 nm.

Examiner's response: King et al. do teach a detection unit (see Fig. 4 where detection unit 28 containing multiple emission detectors is taught. Also see page 4 par. 0041) comprising at least 5 separate fluorescent detector entities (see Fig. 9 where plurality of emission detectors 412 are taught. Thus by teaching plurality King et al. teach a detection unit comprising multiple emission detectors. Fig. 9 shows more than 5 detectors thus teaching at least 5 separate detector entities. See page 5 par 0046 where detection of fluorescent dues is taught. Thus by teaching detection of fluorescent dyes, King et al. teach a detection unit comprising fluorescent detector entities),

King et al. also teach each of said detector entities having a central detection wavelength—depending on the type of filter used), said wavelengths being distinct from each other by at least 25 nm (see page 3 par. 0028 where use of any of a plurality of fluorescent dyes having various excitation wavelengths is taught. King et al. go on to teach some examples but not limited to namely Fluoroscein (520-550 nm), Rhodamine (580-620 nm), dye derivatives of Fluoroscein, dye derivatives of Rhodamine etc. (As can be seen from the

wavelengths taught above that central detection wavelengths are distinct from each other by at least 25 nm. By teaching use of any of a plurality of fluorescent dyes having various excitation wavelengths, King et al. teach each of said detector entities having a central detection wavelength, said wavelengths being distinct from each other by at least 25 nm.

c. Applicant correctly argues that King et al. fails to disclose 5 optical fiber bundles. Examiner has used Pinkel et al. to teach 5 optical fiber bundles.

Pinkel et al. teach

1) use of optical fiber bundles (see abstract where plurality of groups of optical fibers are taught).

2) a plurality of a least 5 optical fiber bundles, (see abstract where plurality of groups of optical fibers are taught. By teaching plurality of groups of optical fibers Pinkel et al. teach a plurality of a least 5 optical fiber bundles),

d. Applicant argues that King et al. do not teach a device wherein the excitation and detection units are located in separate housings. Examiner disagrees. See fig. 7 where King et al. teach an instrument where detection unit 18 and excitation unit 16 are located in separate housings.

e. Applicant further argues that King et al. and Pinkel et al. fail to appreciate the benefits and precision provided by the minimization of dichroic mirrors in the instrument claimed. Here Applicant is arguing limitations that are not recited in instant claims. No language regarding --"benefits"--- “precision provided”--- and --- “minimization of dichroic mirrors”--- is present in the instant claims.

f. Finally Applicant argues that one of ordinary skill in the art would not be motivated to combine the teaching of Pinkel et al. in the method of King et al. This is not found persuasive as King et al. state “The lightpipe 24 can be any suitable device for carrying wavelenghts of light from one location to another without causing a significant loss or shift in wavelength.” They go on to state "such devices can include, for example, one or more fiber optic devices for transmitting the light to the sample from a remote location, and /or for transmitting the light from the sample to a remote location” (page 4 par. 0043). So King et al. teach to one of ordinary skill the advantages associated with using a light pipe.

Pinkel et al. teach use of optical fiber bundles for transmitting the light to the sample from a remote location (light source), and /or for transmitting the light from the sample to a remote location (detector). Pinkel et al. also state “the inclusion of fibers bearing biological binding partners specific for various analytes known to create a background signal in a particular assay provides a means for simultaneously measuring and substracting out the background signal.” (see col 1 lines 64-67 and col. 2 lines 1-5). Thus by teaching of Pinkel et al. one of ordinary skill knows that optical fiber bundles can be used as a light pipe to simultaneously measure multiple signals. Thus one of ordinary skill in the art has a reasonable expectation of success of making a fiber optics based PCR instrument where use of optical fibers to conduct the light from the light source to the sample and fluorescent emission signals from the sample to detector will contain a lightpipe made of fiber optic bundles. As a result of use of optical fiber

bundle light pipe the resulting PCR instrument will be able to transmit the light signals from the source to the sample and from sample to fluorescent detectors without causing a significant loss or shift in wavelength. Thus, resulting instrument can simultaneously measure the various labeled products made in real time with improved efficiency, sensitivity and accuracy.

Thus Examiner has demonstrated that each of the elements recited in instant claim 15 are taught by the previously cited references.

Hence previously cited rejections of claim 15-17 over King et al. in view of Pinkel et al. and Glazer et al. are being maintained.

Claim Objections

5. Claim 15 is objected to because of the following informalities: Claim 15 recites ---"a plurality of a least"----. The claim should read---- a plurality of "**at**" least--- Appropriate correction is required.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary.

Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

8. Claims 15-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over King et al. (US PG pub. 2004/0014202 A1 with filing date of May 19, 2003 and priority back to May 17, 1999—previously cited) in view of Pinkel et al. (US pat. 5,837,196 issued November 17, 1998 previously cited) and Glazer et al. (US pat. 6,150,107 issued Nov 21, 2000—previously cited).

Regarding claim 15, King et al. teach a real time PCR instrument (see page 3 par. 0029 and 0030 where real time detection of PCR is taught) comprising:

-an excitation unit (see Fig. 1 where light source 16 is taught) comprising:

- at least 1 light source (see page 5 par. 0050 where one Light emitting diode (LED) or an array of LEDs is taught. Thus teaching at least 1 light source) capable of emitting light toward a reaction vessel (see fig. 1 the light source 16 is source capable of emitting light toward a reaction vessel 10) containing fluorescent compounds (see page 4 par. 0045 where plurality of fluorescent dyes are added to sample 12 contained in reaction vessel 10 thus teaching a reaction vessel containing fluorescent compounds),

- a lightpipe (see page 4 par. 0044 where light pipe 40 is taught) being arranged for receiving light from the reaction vessel (see page 4 par. 0043

where a light pipe 24 is taught. The lightpipe can be located between light source and the sample and/or between detector and the sample. Thus teaching a lightpipe being arranged for receiving light from the reaction vessel) and capable of distributing homogeneously said light for transmission (see page 4 par. 0043 where King et al. teach the lightpipe allows the generation of an excitation wavelength, and/or the detection of an emission wavelength, remotely from the sample well. The lightpipe 24 can be any suitable device for carrying wavelengths of light from one location to another without causing a significant loss of strength or shift in wavelength. Thus King et al. teach a lightpipe being arranged for receiving light from the reaction vessel and capable of distributing homogeneously said light for transmission) to optical fiber bundles (see page 4 par. 0043 where King et al. teach such devices to include one or more fiber optic devices for transmitting the light to the sample from a remote location, and/or fro transmitting the light from the sample to a remote location. Thus by broadly teaching one or more fiber optic devices for transmitting the light King et al. teach optical fiber bundles),

- - a detection unit (see Fig. 4 where detection unit 28 containing multiple emission detectors is taught. Also see page 4 par. 0041) comprising at least 5 separate fluorescent detector entities (see Fig. 9 where plurality of emission detectors 412 are taught. Thus by teaching plurality King et al. teach a detection unit comprising multiple emission detectors. Fig. 9 shows more than 5 detectors thus teaching at least 5 separate detector entities. See page 5 par 0046 where detection of fluorescent dues is taught. Thus by teaching detection of

fluorescent dyes, King et al. teach a detection unit comprising fluorescent detector entities), each of said detector entities having a central detection wavelength (see page 7 par. 0066 where King et al. teach one or more emission filters can be associated with an emission beam from an excited dye. One or more filters can be located between the sample and one or more emission beam detectors. Thus by teaching use of filter associated with emission beam detector, King et al. teach each of said detector entities having a central detection wavelength—depending on the type of filter used), said wavelengths being distinct from each other by at least 25 nm (see page 3 par. 0028 where use of any of a plurality of fluorescent dyes having various excitation wavelengths is taught. King et al. go on to teach some examples but not limited to namely Fluoroscein (520-550 nm), Rhodamine (580-620 nm), dye derivatives of Fluoroscein, dye derivatives of Rhodamine etc. (As can be seen from the wavelengths taught above that central detection wavelengths are distinct from each other by at least 25 nm. By teaching use of any of a plurality of fluorescent dyes having various excitation wavelengths, King et al. teach each of said detector entities having a central detection wavelength, said wavelengths being distinct from each other by at least 25 nm),

- means for heating and cooling (see page 8 par 0081 where apparatus adapted for use in a nucleic acid sequence amplification reaction is taught. Thus by teaching apparatus adapted for use in a nucleic acid sequence amplification i.e. PCR reaction, King et al. teach means for heating and cooling), and

- multiple reaction vessels for containing a reaction mixture (see page 6 par. 0060 where microtiter card such as 96-well microtiter card is taught thus teaching multiple reaction vessels for containing a reaction mixture);

and wherein the excitation and detection units are located in separate housings. (See fig. 7 where King et al. teach an instrument where detection unit 18 and excitation unit 16 are located in separate housings).

Regarding claim 16, King et al. teach a real time PCR instrument according to claim 15 comprising one light source (see page 5 par. 0050 where one Light emitting diode (LED) is taught as one light source).

Regarding claim 17, King et al. teach an instrument according to claim 15. The limitation recited in claim 17, wherein said central detection wavelengths are selected from a group of range of wavelengths, said group consisting of 520-540 nm, 545-565 nm, 570-590 nm, 600-620 nm, 630-650 nm, 660-680 nm, and 700-720 nm. The range of wavelengths recited only indicate intended use and do not provide further structural limitation to the claimed instrument and hence are not being considered further.

Regarding claim 15, King et al. do not explicitly recite use of

1) optical fiber bundles. As described above King et al. just refer to one or more fiber optic devices.

2) a plurality of a least 5 optical fiber bundles, each said bundle being arranged for receiving homogeneously distributed light from the lightpipe, and transmitting said light to said fluorescent detector entities;

3) wherein said plurality of detector entities is capable of simultaneously detecting maximum fluorescence emission of at least five different fluorescent compounds,

Regarding claim 15, Pinkel et al. teach:

1) use of optical fiber bundles (see abstract where plurality of groups of optical fibers are taught).

2) a plurality of a least 5 optical fiber bundles, (see abstract where plurality of groups of optical fibers are taught.

By teaching plurality of groups of optical fibers Pinkel et al. teach a plurality of a least 5 optical fiber bundles),each said bundle being arranged for receiving homogeneously distributed light from the lightpipe, and transmitting said light to said fluorescent detector entities;

As described above King et al. teach use of a single light source such as LED. They also teach used of a lightpipe. Furthermore King et al. teach location of light pipe can be between light source and sample or between sample and fluorescent detector (described above). Thus if single light source (LED) is used then it will inherently emit homogeneously distributed light into the lightpipe. If fiber optic bundles taught by Pinkel et al. are used as the fiber optic device in the light pipe to conduct the light from the excitation light source to the sample and then from the sample to the multiple detection units then one inherently gets the claimed arrangement i.e. each said bundle being arranged for receiving

homogeneously distributed light from the lightpipe, and transmitting said light to said fluorescent detector entities;

3) wherein said plurality of detector entities is capable of simultaneously detecting maximum fluorescence emission of at least five different fluorescent compounds,(as described above depending on wavelength of cut off range of the filter that is used in combination with a detector will determine the maximum fluorescence emission that will be detected by that detector). Depending on the maximum fluorescence emission of at least five different fluorescent compounds mixed into sample (as taught by King et al.) one of ordinary skill in the art can set the filters of at least 5 different detectors to those desired emission ranges appropriate for the chosen dye. Since fiber optic bundles are carrying the light from the source to the sample and then from the sample the fluorescent light from the dye reaches the detector after passing through the filter. Therefore in this embodiment each detector inherently will detect the maximum fluorescence emission of the specific fluorescent compounds whose emission is in the range set by the filter used. If 5 different maximum fluorescence emission are expected then one of ordinary skill in the art uses those appropriate range filters in conjunction with the 5 different detectors that comprise the detection unit then this arrangement meets the limitation recited wherein said plurality of detector entities is capable of simultaneously detecting maximum fluorescence emission of at least five different fluorescent compounds,

It would have been prima facie obvious to one of ordinary skill in the art to combine a plurality of optical fiber bundles as taught by Pinkel et al. in the

fluorescent detection system taught by King et al. to monitor real time PCR amplification at the time the invention was made.

The motivation to do so is provided to one of ordinary skill in the art by teachings both King et al. and Pinkel et al.

King et al. state “The lightpipe 24 can be any suitable device for carrying wavelenghts of light from one location to another without causing a significant loss or shift in wavelength.” They go on to state "such devices can include, for example, one or more fiber optic devices for transmitting the light to the sample from a remote location, and /or for transmitting the light from the sample to a remote location” (page 4 par. 0043). So King et al. teach to one of ordinary skill the advantages associated with using a light pipe.

Pinkel et al. teach use of optical fiber bundles for transmitting the light to the sample from a remote location (light source), and /or for transmitting the light from the sample to a remote location (detector). Pinkel et al. also state “the inclusion of fibers bearing biological binding partners specific for various analytes known to create a background signal in a particular assay provides a means for simultaneously measuring and substracting out the background signal.” (see col 1 lines 64-67 and col. 2 lines 1-5). Thus by teaching of Pinkel et al. one of ordinary skill knows that optical fiber bundles can be used as a light pipe to simultaneously measure multiple signals. Thus one of ordinary skill in the art has a reasonable expectation of success of making a fiber optics based PCR instrument where use of optical fibers to conduct the light from the light source to the sample and fluorescent emission signals from the sample to detector will

contain a lightpipe made of fiber optic bundles. As a result of use of optical fiber bundle light pipe the resulting PCR instrument will be able to transmit the light signals from the source to the sample and from sample to fluorescent detectors without causing a significant loss or shift in wavelength. Thus, resulting instrument can simultaneously measure the various labeled products made in real time with improved efficiency, sensitivity and accuracy.

Glazer et al. provides information to one of ordinary skill regarding the various labels that can be used for FRET and the emission wavelengths that are used for their detection. Thus providing guidance regarding what wavelength filters to use for each individual fluorescent detector so that depending on the combination of fluorescent labels that are used and the expected maximum emission wavelengths the multiple detectors will simultaneously detect fluorescence from appropriate fluorescent dye emissions. (See whole patent specially see col. 15 lines 24-42 and Fig. 4).

Conclusion

9. All claims under consideration 15-17 are rejected over prior art.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to SUCHIRA PANDE whose telephone number is (571)272-9052. The examiner can normally be reached on 8:30 am -5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gary Benzion can be reached on 571-272-0782. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Suchira Pande
Examiner
Art Unit 1637

/Suchira Pande/
Examiner, Art Unit 1637